

REMARKS/ARGUMENTS

Claims 1-2, 4-7, and 9-26 are pending in the application. Applicant, by this paper, amends claims 4, 13, 14, 19, and 21. Applicant respectfully requests reconsideration and allowance of all pending claims in light of the amendments and the discussion presented below.

Applicant respectfully requests entry of the amendments as adopting Examiner suggestions and effecting only claim informalities. The claim amendments are believed to place the application in condition for allowance, or at the very least, the amendments place the application in better form for appeal.

Discussion of Claim Objections

Claims 4, 13, and 18-21 were objected to for various informalities. Applicant amends claims 4, 7, 13, 19, and 21 to overcome the objections.

In particular, Applicant amends claim 4, line 4 to include the word “the” prior to “chips in the code word” as suggested by the Examiner.

Applicant amends claim 7 such that “at least fifty percent of estimates stored in the feedback filter comprise more accurate estimates of sliced chips from the encoded symbol.” Thus, claim 5 features “storing the more accurate estimate for the sliced chip in the feedback filter” and claim 7 features at least 50% of estimates in the feed back filter are more accurate estimates. The more accurate estimate referred to in claim 5 is one of the at least fifty percent of estimates stored in the feedback filter that comprise more accurate estimates of sliced chips. Thus, the terms in the claims are now consistent.

Applicant amends claim 13, line 1 to replace the occurrence of “a” with “the” as suggested by the Examiner. Similarly, Applicant amends claims 19 and 21 in the manner suggested by the Examiner. Applicant amends claim 19, line 2 to replace the term “a chip” with “the chip” and amends claim 21, line 3 to replace “a more” and “a sliced” with “the more” and “the sliced” respectively.

Applicant believes that the term “a code word” used in claim 18 is correct as shown. Claim 18 uses the term “plurality of code words, wherein each code word has a plurality of chips” in lines 5-6, but does not recite the term “a code word” prior to the occurrence at line 10.

Applicant respectfully requests withdrawal of the objections to the claims in light of the claim amendments and the discussion of claim 18.

Discussion of Rejections Under 35 U.S.C. §112

Claim 14 was rejected under 35 U.S.C. §112, second paragraph, because the term “the chip” in lines 7-8 lacks antecedent basis. Applicant amends claim 14 to revise the term “the chip” with “a chip”. Applicant respectfully requests withdrawal of the rejections to claims 14-17 in light of the claim amendment.

Claims 4, 9-17, and 20-26 were rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement.

In particular, the Examiner rejects claim 4 for reciting “estimates for a subset of the plurality of chips” and contends that the specification, as filed, does not provide support for such limitation as claimed. Applicant respectfully traverses the rejection.

The written description requirement is not an *in haec verba* requirement. Claim limitations may be supported in the specification through express or implicit disclosure.

Applicant contends the limitations of claim 4 are fully supported in the specification, as filed. In particular, the term “subset” is commonly defined to mean “a set contained within another set.” Thus, in the context of claim 4, the “estimates for a subset of the plurality of chips in the code word” is defined to be less than or all of the estimates of the plurality of chips in the code word. This is clearly described in Applicant’s specification, as filed.

For example, paragraphs [34] through [38] of the application, as filed, describes deriving more accurate chip slice estimates for 50% of the estimates according to the formulas presented in paragraphs [35] through [38]. Thus, the more accurate chip slice estimates are within the entire set of chip slice estimates, thus defining a subset of estimates of chips.

Moreover, claim 4 does not arbitrarily recite any “estimates for a subset of the plurality of chips,” but rather further states that “at least fifty percent of the more accurate sliced chip estimates are based on the correlation among the chips in the code word.” This limitation appeared in claim 4, as originally filed, and is expressly supported in the specification, at paragraphs [34] through [38]. Thus, as recited in claim 4, the “estimates for a subset of the plurality of chips” refers to the subset where “at least fifty percent of the more accurate sliced chip estimates are based on the correlation among the chips in the code word.” Thus, the specification, as originally filed, supports the claim, as does the original language of claim 4.

Claim 6 is amended to remove the term “a portion of” that appears to be the source of the rejection of the claim. Support for claim 6 is found within the specification, as filed, for

example, at FIG. 2, and at paragraph [25]. FIG. 2 illustrates the output of the feedback filter as coupled to one input of the combiner. The encoded symbol from the feed forward filter is coupled to the another input of the combiner.

Claims 9, 10, 14, 20, 22, and 25 are rejected for use of the terms “an identification of the chip,” “chip identification values,” “an identification of the sliced chip,” and “identify a chip value.” Applicant respectfully traverses the rejections.

Applicant’s specification, as filed, expressly supports identification of a chip or otherwise identifying a chip value. For example, paragraph [27] of the application, as filed, describes: “When an encoded symbol is sent to the chip slicer 60, the chip slicer 60 preferably *identifies a subset of the symbol that represents a single chip. The correct identification of a chip* is very important because if a chip is not correctly identified, then DFE error propagation will result...” (*emphasis added*). Furthermore, paragraph [28] of the specification, as filed, states: “in the training portion of the frame, it is well known to provide information relating to *the identification of chips.*” (*emphasis added*).

Applicant’s specification, at paragraph [29] expressly states that “the construction of code words introduces a certain correlation between the various chips that comprise a code word.” Applicant’s specification, at paragraph [34], goes on to state: “Knowledge of this structure allows the use of decision directed adaptation.” Applicant’s specification then provides formulas in paragraphs [35] through [38] that capitalize on the chip correlations described in paragraphs [30] through [33]. Thus, these paragraphs describe how the identification of a chip can be based on one or more chips in a code.

Moreover, as expressly shown in FIG. 5, the feedback filter can include tap values that are based on one or more chip identification outputs from the chip slicer. The specification expressly describes the output of the feedback filter as coupling a noise component to the combiner. (“The feed back filter 70 advantageously feeds the noise component back into the chip slicer 60 by way of the chip combiner 50.” *Specification*, at paragraph [25].) Thus, the specification expressly supports a noise component based on one or more sliced chips.

The Examiner also appears to reject the claims for the use of the term “chip value.” However, this term expressly appears in the specification, as filed. In particular, FIG. 6C shows pseudo code, and the comments portion of the pseudo code states: “modify FBF contents based on more accurate *sliced value.*” The sliced value refers to the chip slice value. Therefore, Applicant’s specification, as filed, supports the claim language.

Discussion of Rejections Under 35 U.S.C. §102

Claims 1, 2, 4-7, 9-14, 16-22, and 24-26 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 6,233,273 to Webster et al. (hereinafter Webster). Applicant respectfully traverses the rejection and requests reconsideration and allowance of all pending claims.

In order for a claim to be anticipated by a reference, the single prior art reference must describe, either expressly or inherently, each and every element as set forth in the claim. The Examiner contends that Webster sets forth each and every element of the rejected claims.

Claim 1 recites a method for improved digital communications. The method includes “deriving a more accurate estimate for the sliced chip based on a correlation among the chips in the code word.” This claimed feature is not described in Webster.

Applicant previously argued, in the Amendment dated September 1, 2006, that the coherent matched filter 33 does not operate on a sliced chip, since Webster describes the chip slicer as part of the chip DFE 36 that operates on the output of the channel matched filter 33. Additionally, Webster fails to describe any element that determines an estimate of a sliced chip based on a correlation among chips in a codeword.

The Examiner, in the Response to Arguments, states “note that the office action clearly estates that the claim feature is met by the combiner 73 responsive to the output of the matched filter 33.” *Office Action*, dated October 18, 2006, at page 9. The Examiner’s response further states: “It is alleged that Webster does not teach any element that determined an estimate based on a correlation among the chips of a codeword. However, it is noted at page 3, line 2 of applicant’s own disclosure, the chips are inherently correlated in a codewords hence the estimate teaches by Webster is inherently based on a correlation among the chips in a codeword since the chips are inherently correlated in a codeword.” *Id.*

Applicant contends that the combiner 73 in Webster fails to describe the claimed element in the manner set forth in the claim. Further, Applicant contends that Applicant’s own description of inherent correlation in codewords is not directed to codewords in general, but instead, is a description of a particular property of a particular type of codeword. Further, correlation of chips in a codeword does not make inherent “deriving a more accurate estimate for the sliced chip based on a correlation among the chips in the code word.” Applicant addresses each of the Examiner’s responses in turn.

The Examiner contends “that the claim feature is met by the combiner 73 responsive to the output of the matched filter 33.” *Id.* Additionally, the Examiner argues that “output of

matched filter inherently includes correlation among chips.” *See, Office Action*, at page 4.

However, Webster depicts the channel matched filter (CMF) 33 prior to the chip DFE 36. *See, Webster*, Figure 6 and Col. 6, ll. 20-24. Webster describes the channel matched filter as operating on the signal prior to the chip decision 76, which the Examiner contends describes slicing a chip from the encoded symbol. Webster fails to describe the channel matched filter as having the ability to perform correlation among the chips in the code word. Indeed, the channel matched filter does not have any knowledge of codeword chips and cannot have knowledge of the chips in a codeword because the chip decision does not occur until *after* the operation of the channel matched filter.

The Examiner contends that the combiner 73 derives the more accurate estimate for the sliced chip. However, the Examiner fails to identify any process or element in Webster that provides “a correlation among the chips in the code word.” The Examiner contends that the “output of matched filter inherently includes correlation among chips.” *See, Office Action*, at page 4. Additionally, in the response to Applicant’s arguments, the Examiner contends that “at page 3, line 2 of applicant’s own disclosure, the chips are inherently correlated in a codewords.” *Office Action*, at page 9.

However, the portion of Applicant’s specification relied upon by the Examiner refers to a particular type of codeword described in the detailed description, namely, CCK codewords. The Applicant does *not* contend that *all* codewords have correlation among chips of the codeword. Indeed, such is clearly not the case.

If the Examiner contends that *all* codewords inherently have correlation among chips, then Applicant requests that the Examiner provide support for the contention. In particular, Applicant respectfully request that the Examiner cite to a reference that supports the contention that Hadamard codes or Walsh codes, as described in Webster at Col. 2, ll. 27-28, inherently have correlation among chips.

Additionally, Applicant respectfully requests that the Examiner cite to a supporting reference if the Examiner contends that a channel matched filter inherently performs correlation of chips in a codeword. Applicant contends that no such reference is available, because the channel matched filter operates to equalize the channel impulse response, and does not operate on a chip basis.

Applicant respectfully requests reconsideration and allowance of claim 1, because Webster fails to describe every element of the claim in the manner set forth in the claim.

Claims 9 and 14 include the feature of “the chip slicer configured to determine an estimate of an identification of the chip based in part on a correlation to one or more chips in the code word.”

Claim 18 includes the feature of “means for deriving a more accurate estimate for the sliced chip based on a correlation among the chips in a code word.” **Claim 22** includes “determining an identification of the sliced chip based in part on a correlation among the plurality of chips in the codeword.” **Claim 25** includes “the chip slicer configured to extract a chip slice from the encoded signal stream and identify a corresponding chip value based in part on a correlation with one of the plurality of chips of the code word.”

Therefore, claims 9, 14, 18, 22, and 25 are believed to be allowable at least for the reasons provided above in relation to claim 1. Applicant respectfully requests reconsideration and allowance of claims 9, 14, 18, 22, and 25.

Claims 2, 4-7, 10-13, 15-17, 19-21, 23-24, and 26 depend, either directly or indirectly, from one of independent claims 1, 9, 14, 18, 22, or 25 and are believed to be allowable at least for the reason that they depend from an allowable base claim.

Applicant respectfully requests reconsideration and allowance of all pending claims.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application and all of the claims are in condition for allowance. Applicant respectfully requests further examination, reconsideration, and allowance of the claims.

If there are any fees due in connection with the filing of this response, please charge such fees to our Deposit Account No. 17-0026. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for, such an extension is requested and the fee should also be charged to our Deposit Account. Applicants therefore respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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